FOREST BIRDS SURVEY PROTOCOL

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COVER PHOTO CREDITS
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10.0 FOREST BIRDS SURVEY PROTOCOL

10.1 INTRODUCTION
This survey protocol provides instruction on conducting forest bird surveys and collecting data on the occupancy (presence/not-detected) of avian species in a given survey area during the breeding season. Detection of birds demonstrating breeding behaviour such as singing, territorial defence, carrying nesting material, food or fecal sacs is considered sufficient evidence to confirm breeding. Avoidance is strongly recommended for the duration of the breeding season where breeding is suspected or confirmed.

10.1.1 Inventory Group
The boreal forest in Canada provides breeding habitat for a large proportion of the world’s land birds. For example, over 80 per cent of the global populations of the Black-backed Woodpecker (*Picoides arcticus*), Connecticut Warbler (*Oporornis agilis*), Cape May Warbler (*Setophaga tigrina*) and Bay-breasted Warbler (*Setophaga castanea*) breed in Canada’s boreal forest (Blancher 2003).

Forests provide crucial habitat for breeding birds of diverse taxa that may be detected using this protocol. Certain species require specific survey methods not covered by this survey protocol. Species that may be observed while following the Forest Bird Survey Protocol method include, but are not limited to, the Common Nighthawk; Western Grebe; Yellow Rail, and; forest raptors. Separate survey protocols are available for these and other species.

10.1.2 Status and Distribution
Birds breeding vary widely in distribution. Due to numerous disturbances on the landscape in summer use habitats, a number of once-abundant species have shown declining population trends (Blancher 2003). Habitat loss and fragmentation are thought to play a large role in the declines. Harvesting in the boreal mixedwood affected bird community composition up to 28 years after logging (Hobson and Schieck 1999). These surveys will help identify the breeding bird species occurring in Saskatchewan forests. This information may inform species status by providing information on distribution and habitat use and could assist mitigation and planning processes.

For information on the status of the forest birds of Saskatchewan, please visit the Saskatchewan Conservation Data Centre (SKCDC). Additional information may be provided in the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) Status Reports, in the *Species at Risk Act (SARA)* Registry documents and in the follow. Identification characteristics and habitat affiliations for forest bird species are available from a number of references including The Atlas of Saskatchewan Birds. The Canadian portion of the Breeding Bird Survey (BBS) program is administered by Environment Canada and may provide data on a number of provincial species. Additional information on boreal bird species, survey locations and result standardization methods can be found on the Boreal Avian Monitoring Project (BAM) website.
10.1.3 Biology
Saskatchewan forests see an influx of avian neotropical migrants each spring that come to take advantage of the seed and insect resources that these habitats provide during the growing season. Most birds begin laying eggs and raising young soon after arriving. Pairing is typically initiated on the breeding ground in early May to June. Nesting follows and continues until late summer for most species.

During the breeding season, males sing to attract mates and to defend territories. Females of some species also sing or call in response. Bird activity and calling varies throughout the day but territorial defense peaks in most birds in the early morning hours. Surveys are timed to coincide with peak territorial activity (Ralph et al. 1995).

Female songbirds are somewhat cryptic in appearance; the males are more readily identifiable by sight if an unobstructed view is possible. However, far more birds, particularly males are heard than are seen in forest environments. Auditory outputs greatly assist in the detection and identification of species where visual detection through dense foliage can be very difficult.

Woodpeckers occupy similar habitats and can also be identified by sight and sound. Males and females are distinguishable and both use identifiable patterns of drumming, in addition to calling, to communicate (Poole 2012).

10.2 SURVEY STANDARDS
The standards provide instructions on the areal extent of surveys to be conducted. They provide information on experience, capabilities, minimum equipment needs, survey conditions and permit requirements.

10.2.1 Survey Area Extent
Surveys must be conducted in areas with SKCDC observations as well as in any areas that provide suitable habitat for the species in question. The proposed project area, plus the appropriate setback distances, must be assessed. All suitable habitat within this area must be surveyed. Setback distances identified in the Saskatchewan Activity Restriction Guidelines for Sensitive Species (Saskatchewan Ministry of Environment 2014a) are based on the species and the level of disturbance associated with the project.

10.2.2 Personnel
Personnel must be able to identify forest birds by sound and by sight, identify suitable habitat and be familiar with the survey methodology. Personnel must have a well-developed search image for forest birds. Different species may be confusingly similar in voice and appearance; considerable study is required to correctly identify them. Due to the large variety of birds and the variation in dialects between regions, identification of these bird species requires rigorous training (Diefenbach et al. 2003.) and local experience surveying forest birds locally (USGS 2010). The need for experienced personnel cannot be overemphasized.
10.2.3 Survey Effort
Three survey visits must be completed to provide adequate detection of breeding birds (Huff et al. 2000, M.W. Alldredge pers. comm.). Singing and resulting detection probabilities are heterogeneous during the breeding season (Alldredge et al. 2007a), therefore multiple surveys must be carried out over the breeding season to increase detection levels (Huff et al. 2000; Gregory et al. 2004). Three visit surveys are very important for rare species detection (M.W. Alldredge pers. comm.).

Surveys are to be spaced seven to 10 days apart (Huff et al. 2000, RIC 1999; Matt Alldredge pers. comm.). Rotate crews among sites to reduce observer bias in data (RIC 1999). Another option is to carry out surveys until the asymptote of the species visit curve calculation is reached (RIC 1999).

Once target species are detected, subsequent survey visits are not necessary. However, if additional surveys are not conducted to detect additional individuals, presence is assumed in suitable habitat throughout the project area and the appropriate setback distances in the Saskatchewan Activity Restriction Guidelines for Sensitive Species (Saskatchewan Ministry of Environment 2014a) must be applied.

10.2.4 Time of year
Surveys must be conducted in the spring between June 1 and July 7 in the north and May 25 and June 30 south of the southern boreal/mixed-wood forest. This corresponds to the breeding period of most passerine species in Saskatchewan. Surveys are to be completed before most nestlings have fledged (Huff et al. 2000).

10.2.5 Time of Day
Surveys are to be carried out between sunrise and ending no more than four hours later (Ralph et al. 1995, Brandes 2008, Hobson and Van Wilgenburg, 2002, RISC 1999; S.K. Davis pers. comm. May 3, 2013) to capture the highest, most stable singing rate (Ralph et al. 1995, RIC 1999).

10.2.6 Environmental Conditions
A compendium of environmental condition standards (Saskatchewan Ministry of Environment 2014b) has been prepared to complement the survey protocols for Saskatchewan. The full range of values for the respective environmental condition (e.g., temperature, precipitation, cloud cover, noise, etc.) has been provided in the standards document with the expectation that appropriate value range(s) will be applied as per the survey protocol parameters.

Surveys must not be performed under cold conditions which inhibit calling (i.e., less than 0°C), when there is precipitation, or when winds are over level 3 (>20 km/h) on the Beaufort scale. Surveys must also be postponed if background noise hinders detection of birds (i.e., rustling of wind, industrial noise, etc.) until noise is reduced or wind direction is more favourable.
10.2.7 Equipment List
- GPS receiver
- Camera
- Thermometer
- Binoculars
- Omnidirectional recorder
- Bird identification sources (e.g., books, APPs, tapes, CDs)
- Stopwatch
- Blank mapping data sheet
- Bird Survey Loadform

10.2.8 Permit Requirements
Notification is requested for forest bird surveys. Notification implies the appropriate survey protocol(s) will be used and data loadforms submitted. Survey protocols and loadforms are available on the ministry Research Permit downloads webpage. Please refresh your internet browser to clear any cached websites or bookmarks for this website to ensure you have the most up-to-date information and document versions. Properly conducted surveys and reliable data submissions are vital tools required to understand and manage wildlife populations and their habitat. Data submissions also facilitate and expedite environmental assessment reviews by Fish and Wildlife Branch.

10.3 SURVEY METHODS
The survey methods describe the procedures for conducting specific forest bird surveys.

10.3.1 Procedures
The point count surveys are designed to detect the presence of forest birds using widely used procedures. Detection through recording equipment and/or skilled personnel carrying out surveys is acceptable, provided they follow the procedures described below.

10.3.1.1 Point Counts
Point count surveys may be carried out from a vehicle or on foot. Motorized vehicles may only be used where access is available and where potential for environmental damage is negligible. Keep on trails and do not drive near or through sensitive areas. The engine must be shut down at each point count station location. Personnel must move away from the vehicle at each point count station and be as quiet as possible.

Survey points must be spaced 250 metres apart and provide coverage of the survey area. At each station, a 10-minute passive survey must be conducted (S.L. Van Wilgenburg pers. comm.). The 10-minute count is to be broken down into a zero-to-three minute category (S.L. Van Wilgenburg pers. comm.) and a three to 10-minute category.

Note any birds that flush from the area. These birds must be included in the count if they are not encountered later during the survey period. Wait at least one minute before beginning the survey to allow birds to settle (Gregory et al. 2004) and to document required data (RIC 1999) in the loadform and set up the recorder. It will also allow engine noise to cease if using a vehicle. Point counts and recording must begin and end simultaneously. Personnel are to remain still and quiet throughout the count.
Distance estimates are difficult and prone to error, so an unlimited distance from observer to the bird is to be used instead (E.E. Cumming and M.W. Allredge pers. comm.). The observer must listen for bird vocalizations and scan the area for visual sightings. Individual birds heard at one stop must not be recorded again at subsequent stops. Observations must be mapped on blank mapping data sheets using standard breeding bird mapping symbols to reduce the likelihood of double counting a bird at another survey point.

**10.3.1.2 Bio-acoustic Recorders/Songmeters**

Provided survey standards are met, digital recording devices are an acceptable alternative. If less experienced observers are used, a recording must be made at each survey location. Recordings must be reviewed by senior observers with expertise in identifying recorded birds. Auditory recordings provide a back-up to confirm field observations (Downes et al. 2000) and are recommended for all observers. Auditory recordings provide a back-up to confirm field observations (Downes et al. 2000) and are recommended for all observers.

**10.3.1.2.1 Recording Equipment**

Use an omnidirectional microphone and recording device to record bird vocalizations. Position the recording equipment in a north/south direction. With the right microphone on the east side, arrange the recording device and microphone as far apart as possible to ensure noise made by the observer is equally delivered to both microphones. Consult the manual to determine the appropriate recording level of the microphone being used.

**10.3.1.2.2 Standardized Recording Procedure**

Ensure recording levels are standardized to allow for comparisons and to reduce the chance of poor quality recordings. Recordings must be made at ≥320 kbps. At the start of each point count recording, state the date, observer name, point count location and time.

Birds that are seen, but are not vocalizing are to be verbally identified (e.g., “western tanager flying over”) to document the presence of the bird in the recording. Ensure the recordings are properly saved to the recorder and backed up at regular intervals (i.e., daily as a minimum) to a computer.

**10.4 SUBMISSIONS**

Please refer to the Submissions section under the Standard Permit Conditions on the Ministry of Environment website. Observations should be submitted using the appropriate loadform from the Biodiversity webpage. Any incidental wild species (plant or animal) observations should also be submitted to the ministry (ENV.researchpermit@gov.sk.ca) using the Plant or Wild Species Loadform respectively.

iMapInvasives is the provincial system for submitting the occurrence of invasive plant or animal species. Any observations of prohibited, noxious or nuisance weeds, along with observations of any other invasive species, should be submitted using this website. An account is not required to submit observations. If you have any questions, please contact the SKCDC for more information.
10.5 ADDITIONAL RESOURCES
Alberta Species at Risk Reports

Alberta Status Reports

All about Birds. Bird Guide. The Cornell Lab of Ornithology

Boreal Avian Monitoring Project

Dendroica, a bird identification aid

Hinterland Who’s Who - Boreal Forest Species Fact Sheet

Hinterland Who’s Who – Boreal Forest Video and Sound 30 Seconds

Hinterland Who’s Who – Boreal Forest Video and Sound 60 Seconds

Manitoba Breeding Bird Atlas - Atlas des oiseaux nicheurs du Manitoba


Saskatchewan Activity Restriction Guidelines for Sensitive Species

Saskatchewan Activity Restriction Guidelines for Sensitive Species Background Information

Saskatchewan Conservation Data Centre (SKCDC)

The Atlas of Saskatchewan Birds

The Encyclopedia of Saskatchewan

10.6 LITERATURE CITED


10.7 PERSONAL COMMUNICATION
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